

THE INVENTION CLAIMED IS:

1. A free-standing open-span building frame comprising:
first and second base plates, first and second upright posts, first and
second post-joist-rafter connectors, and a joist;
5 each base plate comprising a steel plate having an upper surface to
which is welded the lower end of a steel post connector that is
channel, round beam or HSS with a rectangular cross-section.
each post having a lower end bolted to the respective steel post
connector of the first and second base plate;
10 each post-joist-rafter connector comprising a post connector, a joist
connector and a rafter connector;
the first post having an upper end bolted to the post connector of the first
post-joist-rafter connector, and the second post having an upper
end bolted to the post connector of the second post-joist-rafter
15 connector; and
the joist having first and second joist ends, the first joist end being bolted
to the joist connector of the first post-joist-rafter connector, and
the second joist end being bolted to the joist connector of the
second post-joist-rafter connector,
20 2. The building frame of Claim 1 including a steel reinforced concrete
foundation with an anchor bolts extending through the base plate anchor
bolt holes of each base plate, each base plate being secured to the
anchor bolts with nuts.
3. A building frame of Claim 1 including a ridge connector and first and
25 second rafters,
the ridge connector having first and second rafter connectors; and
each of the rafters having a post end and a rafter end, the post end of
the first rafter being bolted to the rafter connector of the first post-
joist-rafter connector, the post end of the second rafter being
30 bolted to the rafter connector of the second post-joist-rafter
connector, the ridge end of the first rafter being bolted to the first

rafter connector, and the ridge end of the second rafter being connected to the second rafter connector.

4. A building frame of Claim 1 for a hip roof construction wherein the rafter connector of each post-joist-rafter connector has a connecting surface which has a hip rafter angle.
5. A building frame for a hip roof construction comprising a main frame and a hip frame of Claim 1 adjacent thereto, the main frame including first and second main frame post-joist-rafter connectors, first and second main frame rafters, and a ridge connector having first and second main frame rafter connectors and first and second hip rafter ridge connectors, the rafter connectors of the first and second main frame post-joist-rafter connectors each having a connecting plate aligned with the angle of its respective main frame rafter,
- each of the first and second main frame rafters having a post end and a ridge end, the post end of the first rafter being bolted to the rafter connector of the first main frame post-joist-rafter connector, the post end of the second rafter being bolted to the rafter connector of the second main frame post-joist-rafter connector, the ridge end of the first rafter being bolted to the connecting plate of the first main frame rafter connector, and the ridge end of the second rafter being bolted to the connecting plate of the second main frame rafter connector,
- the hip frame including first and second post-joist-hip rafter connectors and first and second hip rafters, each of the post-joist-hip rafter connectors having a post connector, a joist connector and a hip connector; the hip rafter connectors each having a connecting plate aligned with the angle of its respective hip rafter, and said first and second hip rafter ridge connectors each having a connecting plate aligned with the angle of its respective hip rafter;

- a joist having one end bolted to the joist connector of the first post-joist-hip connector and the other end bolted to the joist connector of the second post-joist-hip connector; and
- each of the hip rafters having a post end and a ridge end, the post end
- 5 of the first hip rafter being bolted to the hip rafter connector of the first post-joist-hip rafter connector, the post end of the second hip rafter being bolted to the rafter connector of the second post-joist-hip rafter connector, the ridge end of the first hip rafter being bolted to the first hip rafter ridge connector, and the ridge end of
- 10 the second hip rafter being bolted to the second hip rafter ridge connector.
6. A building frame of Claim 1 wherein the central axes of the posts, joist and rafters lie in a vertical frame plane.
7. A building comprising a plurality of free-standing open-span building
- 15 frames of Claim 1, at least two adjacent frame planes being parallel and having a frame plane-to-frame plane distance of from 3 to 14 meters.
8. A free-standing open-span building frame of Claim 1 including a third post construction spaced between the first and second base plates, the third post construction including a third base plate, third and fourth
- 20 upright posts, a post-joist connector, and a post-rafter connector, the third base plate comprising a steel plate having an upper surface to which is welded the lower end of a steel post connector in a central portion thereof, each steel plate having at least one anchor bolt hole therethrough on each side of the post connector;
- 25 the post-joist connector comprising lower and upper post connectors and two joist connectors, each joist connector being bolted to a joist; the third post having a lower end bolted to the respective steel post connector of the third base plate and an upper end bolted to the lower post connector;
- 30 the post rafter connector having a post connector and a rafter connector; and

the fourth post having a lower end bolted to the upper post connector
and an upper end bolted to a rafter connector.

9. A building frame of Claim 3 wherein the connections between the base plates and posts; between the post-joist-rafter connectors and the posts
5 joists and rafters; and between the rafters and the ridge connector are snug fits secured with bolts and nuts.
10. A building comprising a plurality of frames of Claim 1 including first and second adjacent frames, in at least one pair of adjacent first and second posts, a first reinforcing bar bolted to the top of the first post and to the
10 bottom of the second post, and a second reinforcing bar bolted to the top of the second post and to the bottom of the first post.
11. A building of Claim 8 with girts secured to adjacent posts by self-tapping screws and with purlins secured to adjacent rafters by self-tapping screws.
- 15 12. A building of Claim 8 including first and second steel clips, each having a rafter connector and a ridge purlin connector forming a 90° angle therebetween, a first steel clip rafter connector attached to each of two adjacent rafters and the second steel clip rafter connector attached to other of the two adjacent rafters, and a ridge purlin connector extending
20 between and attached to the ridge purlin connectors of the first and second clips.
13. A free-standing open-span building frame of Claim 1,
wherein the steel post-joist-rafter connector comprises a post channel
with an upper end and a lower end, and a joist channel having a
25 first end and a second end,
the post channel comprises a web and first and second parallel post channel flanges,
the joist channel comprises a web and first and second parallel joist channel flanges, each of the flanges forming a 90° angle with its
30 respective web, the flanges and web of the first end of the joist channel being welded to an outer surface of a post channel flange,

- the flanges and web of the upper end of the post channel being welded to a rafter connector plate positioned at a lower rafter surface angle, the webs of the post channel and the joist channel being in approximately the same plane, and the flanges of the post channel and the joist channel extending in the same direction from their respective webs, and
- a set of bolt holes in the webs adjacent the lower end of the post channel and adjacent the second end of the joist channel.
14. A free-standing open-span building frame of Claim 3 wherein each rafter channel having a web and first and second parallel flanges, the first rafter channel having first and second ends and the second rafter channel having third and fourth ends, each of the flanges of the first and second channels forming a 90° angle with its respective web, the first end web and flanges of the first rafter channel being welded to the third end web and flanges of the second rafter channel, the webs forming a roof peak angle, the second and fourth ends of the channels each having a set of bolt holes for securing rafters to the connector.
15. A ridge connector of Claim 14 wherein each of the rafter channels is mated with the end of a rafter cee-channel and bolted thereto, the outer dimensions of the rafter channel and the inner dimensions of the cee-channel being selected to form a snug fit with maximum surface to surface distances of less than 2 mm.
16. A steel post-joist-rafter connector comprising a post channel with an upper end and a lower end, and a joist channel having a first end and a second end, the post channel comprising a web and first and second parallel post channel flanges, the joist channel comprising a web and first and second parallel joist channel flanges, each of the flanges forming a 90° angle with its respective web,

the flanges and web of the first end of the joist channel being welded to
an outer surface of a post channel flange,

the flanges and web of the upper end of the post channel being welded
to a rafter connector plate positioned at a lower rafter surface
angle, the webs of the post channel and the joist channel being in
approximately the same plane, and the flanges of the post
channel and the joist channel extending in the same direction
from their respective webs, and

a set of bolt holes in the webs adjacent the lower end of the post
channel and adjacent the second end of the joist channel.

17. A post-joist-rafter connector of Claim 16 wherein at least one reinforcing
plate is welded to the web and flanges of the post channel in alignment
with a flange of the joist channel.

18. A post-joist-rafter connector of Claim 16 wherein the rafter is a hip rafter
and the rafter plate is positioned at a hip rafter plate angle.

19. A ridge connector comprising first and second rafter channels, each
rafter channel having a web and first and second parallel flanges, the
first rafter channel having first and second ends and the second rafter
channel having third and fourth ends, each of the flanges of the first and
second channels forming a 90° angle with its respective web, the first
end web and flanges of the first rafter channel being welded to the third
end web and flanges of the second rafter channel, the webs forming a
roof peak angle, the second and fourth ends of the channels each
having a set of bolt holes for securing rafters to the connector.

20. A ridge connector of Claim 19 wherein each of the rafter channels is
mated with the end of a rafter cee-channel and bolted thereto, the outer
dimensions of the rafter channel and the inner dimensions of the cee-
channel being selected to form a snug fit with maximum surface to
surface distances of less than 2 mm.